

WHAT IS CLAIMED IS:

1. A device for treating a tissue in an individual, comprising:
an applicator having a surface disposed to contact the tissue; and
a means to drive said applicator.
2. The device of claim 1, wherein said means to drive said applicator
is single stage actuator or a multi-stage actuator.
3. The device of claim 1, wherein said means to drive said applicator
is a piezoelectric actuator, an electrorestrictive actuator, a magnetorestrictive actuator, or a
high frequency electronic motor or a combination thereof.
4. The device of claim 1, wherein said means to drive said applicator
is magnetically responsive.
5. The device of claim 1, wherein said applicator produces vibratory
motion at a frequency from about 1 Hz to about 40,000 Hz.
6. The device of claim 1, wherein said applicator surface comprises an
abrasive material.
7. The device of claim 6, wherein said abrasive material has a particle
size of about 30 microns to about 120 microns.
8. The device of claim 6, wherein said abrasive is diamond, aluminum
oxide or carborundum.
9. The device of claim 6, where said abrasive is crystalline.

10. The device of claim 9, where said abrasive is ice.

11. The device of claim 6, wherein said abrasive comprises a pharmaceutical, a biologic or a diagnostic.

5

12. The device of claim 1, wherein said applicator surface further comprises a lubricant.

13. The device of claim 12, wherein said lubricant is water, a hydrogel, a lipid, aqueous carbohydrate, petrolatum, an inorganic oil, glycerol or a combination thereof.

10

13. The device of claim 1, wherein said applicator surface is textured.

15

14. The device of claim 1, further comprising a means to dispense a therapeutic or diagnostic material.

20

15. The device of claim 14, wherein said dispensing means comprises: a reservoir containing said therapeutic or diagnostic material, and a permeable membrane through which said therapeutic or diagnostic material is controllably released.

25

16. The device of claim 14, wherein said dispensing means is said abrasive, said abrasive comprising said therapeutic or diagnostic material.

17. The device of claim 16, further comprising a lubricant containing said therapeutic or diagnostic material.

18. The device of claim 17, wherein said therapeutic or diagnostic material is a pharmaceutical.

30

19. The device of claim 18, wherein said pharmaceutical is an anesthetic, nitroglycerin, an anti-nauseant, an antibiotic, a hormone, a steroidal antiinflammatory agent, a non-steroid anti-inflammatory agent, a chemotherapeutic agent, an anti-cancer agent, an immunogen, an anti-viral agent or an anti-fungal agent, a
5 moisturizer, water, or a diagnostic material.

20. The device of claim 19, wherein said antibiotic is tetracycline, streptomycin, sulfa drugs, kanamycin, neomycin, penicillin, or chloramphenicol.

10 21. The device of claim 19, wherein said hormone is parathyroid hormone, growth hormone, gonadotropins, insulin, ACTH, somatostatin, prolactin, placental lactogen, melanocyte stimulating hormone, thyrotropin, parathyroid hormone, calcitonin, enkephalin, or angiotensin.

15 22. The device of claim 19, wherein said anesthetic is lidocaine, bupivocaine, tetracaine, morphine, or fentanyl.

23. The device of claim 19, wherein said immunogen is a vaccine.

20 24. The device of claim 1, further comprising a means to collect ablated tissue or a biomolecule after treating said tissue.

25 25. The device of claim 24, wherein said collection means is a container operably connected to said device or is an absorptive medium.

26. The device of claim 25, wherein said absorptive medium is activated carbon, a dehydrated hydrogel or cotton.

30 27. The device of claim 1, further comprising a means to house said device.

28. The device of claim 27, further comprising two wheels rotatably attached to said housing means.

29. The device of claim 1, further comprising a means to monitor an electrical property of the tissue.

30. The device of claim 29, wherein said monitoring means comprises:
at least one active electrode to electrically contact said tissue at a site of interest;

10 a second return electrode distal to said first electrode to electrically contact said tissue at the site of interest;

an optional electrically conductive fluid interface between said first and second electrodes and the site of interest on said tissue; and

15 a controller to monitor an electrical current between said first electrode(s) and said second electrode, said controller further comprising a microprocessor.

32. The device of claim 30, wherein said monitoring means comprises:
a source of an alternating magnetic field to generate eddy currents in said tissue;

20 a detector to detect said eddy currents;

a controller to monitor said eddy currents, said controller further comprising a microprocessor.

33. The device of claim 30, wherein said electrical property is conductivity, impedance or hydration.

34. A method for treating tissue, comprising:
contacting the tissue at a site of interest with the surface of the applicator of the device of claim 1;

30 actuating said applicator comprising said device via the driving means; and

altering said tissue at the site of interest thereby treating the tissue.

35. The method of claim 34, further comprising:

5 dispensing a pharmaceutical, a biologic or a diagnostic to said altered tissue.

36. The method of claim 35, wherein said pharmaceutical, biologic or diagnostic is dispensed simultaneously with said tissue alteration or subsequently to said tissue alteration.

10

37. The method of claim 35, wherein said pharmaceutical is an anesthetic, nitroglycerin, an anti-nauseant, an antibiotic, a hormone, a steroidal antiinflammatory agent, a non-steroid antiinflammatory agent, a chemotherapeutic agent, an anti-cancer agent, an immunogen, an anti-viral agent or an anti-fungal agent, a moisturizer, water, or a diagnostic material.

15

38. The method of claim 37, wherein said antibiotic is tetracycline, streptomycin, sulfa drugs, kanamycin, neomycin, penicillin, or chloramphenicol.

20

39. The method of claim 37, wherein said hormone is parathyroid hormone, growth hormone, gonadotropins, insulin, ACTH, somatostatin, prolactin, placental lactogen, melanocyte stimulating hormone, thyrotropin, parathyroid hormone, calcitonin, enkephalin, or angiotensin.

25

40. The method of claim 37, wherein said anesthetic is lidocaine, bupivocaine, tetracaine, morphine, or fentanyl.

41. The method of claim 37, wherein said immunogen is a vaccine.

30

42. The method of claim 34, further comprising:

monitoring an electrical property of said tissue to control the alteration thereof.

43. The method of claim 42, wherein said monitoring comprises:
5 contacting said tissue at the site of interest with at least one active electrode and a return electrode distal to said electrode;
monitoring an electrical current between said active electrode(s) and said return electrode via a controller; and
correlating said electric current with the electrical property of said tissue.

10 44. The method of claim 43, further comprising:
applying an electrically conductive fluid interface between said active electrode(s) and said return electrode and the site of interest on said tissue.

15 45. The method of claim 43, further comprising:
signaling said device to continue altering said tissue or to adjust the altering of said tissue at the site of interest via a microprocessor in said controller.

20 46. The method of claim 42, wherein said electrical property is conductivity, impedance or hydration.

25 47. The method of claim 42, wherein said monitoring comprises:
providing an alternating magnetic field proximally to said tissue;
generating eddy currents via said magnetic field in said tissue;
monitoring said eddy currents via a controller; and
correlating said eddy currents with electrical conductivity of said tissue.

30 48. The method of claim 47, further comprising:
signaling said device to continue altering said tissue or to adjust the altering of said tissue at the site of interest via a microprocessor in said controller.

49. The method of claim 34, wherein said tissue is membranous or non-membranous.

50. The method of claim 49, wherein said membranous tissue is the stratum corneum.

51. The method of claim 49, wherein said non-membranous tissue is bone.

52. The method of claim 34, wherein treating said tissue comprises at least partial ablation of said tissue, a reduction of the mechanical integrity of said tissue, dermabrasion, or a cosmetic procedure.

53. A method of controlling the permeability of a tissue in an individual comprising:

contacting the tissue at a site of interest with the surface of the applicator of the device of claim 1;

altering said tissue at the site of interest;

monitoring an electrical property of said tissue at the site of interest;

applying an algorithm to evaluate the electrical property;

comparing the value obtained for said electrical property to a predetermined value wherein said values correlate to the permeability of said tissue;

determining if said obtained value is at least equal to said predetermined value; and

signaling the device via the controller to continue altering said tissue if the obtained value does not at least equal the predetermined value thereby controlling the permeability of said tissue at the site of interest.

54. The method of claim 53, wherein said monitoring comprises:

contacting said tissue at the site of interest with at least one active electrode and a return electrode distal to said electrode; and

monitoring an electrical current between said active electrode(s) and said return electrode via a controller.

5

55. The method of claim 54, further comprising:

applying an electrically conductive fluid interface between said active electrode(s) and said return electrode and the site of interest on said tissue.

10

56. The method of claim 53, wherein said monitoring comprises:

providing an alternating magnetic field proximally to said tissue;

generating eddy currents in said tissue via said magnetic field; and

monitoring said eddy currents via a controller.

15

57. The method of claim 53, further comprising:

dispensing a pharmaceutical to the site of interest, wherein said pharmaceutical is dispensed during said monitoring step or subsequent to reaching said predetermined value of the electrical property.

20

58. The method of claim 53, wherein said predetermined value of said electrical property is a known value or is obtained prior to treating said tissue.

59. The method of claim 58, wherein said predetermined value of said

electrical property is obtained from the same individual or within a group of individuals.

25

60. The method of claim 43, wherein said electrical property is conductivity, impedance or hydration.